ES and H PROJECT ADS

1/22/2001

ADS #: AA0D0007 **TYPE:** ESH

C-A TRITIATED COOLING WATER SYSTEM MODIFICATIONS

WHEN REVISING ADS - ATTACH ADDITIONAL SHEETS AS REQUIRED !!

PROJECT CHAMPION: LESSARD, E. **EXT** 4250

RESPONSIBLE_DEPT: AD **MAIL:** 911B **EMAIL:** lessard1@bnl.gov

DOE_MGR: GRANZEN, G. **PHONE:** 516-344-4089

PROJECT DESCRIPTION:

There are a total of 16 tritiated water systems at C-A that require upgrade work. This activity would continue the program to eliminate the existing underground single pipe or single containment systems, eliminate connections to groundwater recharge and add PC controls, monitoring and alarms to all systems. Once upgraded, all systems will comply with Suffolk County Article 12. AGS GPP/KA project 1 of 13 (FY98 Start)

PROJECT APPRAISAL / JUSTIFICATION:

BENEFIT

1) Bring systems into compliance with Suffolk County Article 12.
2) Eliminate potential for unmonitored leak of radioactive liquid to impact contiguous ground and eventually groundwater.

The C-A staff has determined that there is no off-site environmental impact due to a release of tritiated water at AGS. However, we anticipate that off-site public outrage would materialize from an inconsequential release on-site. An event in January 1998 was high-lighted in New York's Newsday even though environmental standards were not violated. We consider public outrage as a potential off-site environmental impact when working with tritiated water.

The C-A Department has identified all tritiated water systems and we find piping, evaporative coolers, cooling towers and hoses can leak. As a result of our reviews many systems have been secondarily contained, alarmed and monitored. We note that if the C-A were to lose all tritiated water from all systems all at once, less than 0.01% of the New York State Drinking Water Standard would be measurable at a recharge basin or at the Sewage Treatment Plant.

Even though we calculate the potential off-site tritium impact on the environment to be negligible under any accident scenario, we plan to continue to upgrade tritiated systems to eliminate potential for minor on-site environmental impacts.

The following upgrades are planned:

System 1 (911, 913) -AGS Main Magnet System; may release to storm system; upgrade:
1)pipe storm to sanitary (911 MER has floor drains plugged and new drains to sanitary will be installed in 2001.
PE is doing this work. AGS Main Magnet Systems are monitored and alarmed, and make up is logged.),
2)replace cooler with heat exchanger and reject heat to tower. The system should be replaced with a heat exchanger and tower in order to remove the tritiated water threat. Engineering will to start in 2001.

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System 2 (911, 913) -AGS Chilled Water; may release to storm system (PE will be changing drains in 911 MER over from storm to sanitary in 2001); upgrade:
1)pipe storm to sanitary and (done)
2)add PC control and monitoring to commence in 2001.
3)install heat exchanger and disconnect 911 heating/cooling units in offices. This should be accomplished by C-A and PE by October 2000. April 2001.

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System 3 (911 TE, 913, 18 houses) - AGS Fast Quad; may release to storm sewer or ground (PE will be changing

...ns over from storm to sanitary in ~~2000~~/2001); upgrade:
1) add local chillers at 18 houses which prevents tritium from being formed in these water systems. *Engineering has started in 2001.*
2) add PC monitoring and control (system will be alarmed makeup logged by September 2000) *to be completed during 2001)*

System 4 - (911TE, 913) AGS RF Power Amplifier; may release to storm sewer or ground; upgrade:
1) replace cooler with heat exchanger and tower. The system is monitored, alarmed and makeup is logged. There is no secondary containment *(Work to start late in 2001)*

System 5 (946) - BLIP Beam stop; no potential release points (secondary containment) ; upgrade:
1) add PC control and monitoring. The system is alarmed, however, PC control and system monitoring are needed. *(to start PLC upgrade in FY01).*

System 6 (927)- Collider Injection, X and Y; may release to ground; upgrade:
1)add PC control and monitoring, and
2) add secondary containment or ensure floor drains are plugged. *Dropped - H^3 below DWS.*

System 7 (932) - AGS F10 and F10 Cooler; may release to storm sewer or ground (~~Gary to check for curbing~~);
upgrade:
1) pipe storm to sanitary,
2) add PC control and monitoring (system is alarmed), and
3) replace cooler with heat exchanger and tower. *(Engineering to start in FY01)*

System 8 (919, 949, 927)- g-2, V Target, V Line; no potential release points; upgrade:
1) add PC control, alarms and monitoring (make up is logged on V Target only) *- to be done during FY01)*
2) Target water and downstream water are separated at this time; however, continued flushing and reduction of tritium inventory is required.

System 9 (912) - C-line is fully covered by secondary containment. A heat exchanger was added. The system has modern controls, is PC monitored and alarmed, and makeup is logged.

System 10 (929, 913, 912) - SEM may release to storm sewer or ground; however, system is inactive at this time and undergoing upgrades to eliminate underground piping. Controls, PC monitoring, alarms and makeup logging will be part of to the new system, which will reside solely in 912. *(to be ~~done~~ completed in FY01 or 02) in progress*

System 11 (929, 913) - RF Cavity; the system is monitored, alarmed and make-up logged. There are no potential release points; however,
1) controls must be upgraded *(to be started in FY-01)*
2) piping runs in outside trench and needs secondary containment *(Engineering effort to start in FY01)*

System 12 (930) - Linac Transport may release to storm sewer or ground (PE will be changing drains over from storm to sanitary in 2000/2001); upgrade: *(to start in FY01)*
1) PC control and monitoring needed. System is alarmed.

System 13 (914, 942)- Booster Magnet and Booster RF; the system is monitored, alarmed and make-up is logged. New controls ~~have been purchased~~ and an upgrade ~~is planned by September 2000~~. *Completed in FY01.*

System 14 (911, 913) - Fan Houses; the French drains are plugged so the system has secondary containment, upgrades:
1) monitoring, alarms and make-up logging needed. *(Work done under system 2 work)*

System 15 - Reference Magnet Cooling - Apply secondary containment to outside piping

Over the last few years, the C-A has upgraded most systems and we have used a mix of funding sources including research accounts. A few systems, as indicated previously, have yet to be upgraded. However, these are planned and will occur over the next few years as funding becomes available. For example $925,000 ~~has been~~ *is currently* programmed for an SEM water system upgrade over FY98-00.

DOE Standards are not as restrictive as Suffolk County Article 12 and C-A water discharges were originally planned to comply with DOE Standards. C-A tritiated water concentrations are below the ALARA Effluent Release Criteria for the public listed in DOE Order 5400.5. Treating effluent discharges ~~like~~ *as if it was* drinking water is a new and challenging requirement. Given the potential for off-site public outrage over inadvertent releases of tritium, the C-A Department plans to continue to meet the Article 12 challenge through upgrades when funds are provided.

Sys 16 Interim - RHIC Upgrade Beam dump

ADS#: AA0D0007

GENERAL INFORMATION:

RPM SCORING:

Before Score -	After Score +	Mgmt Adjustment =	Total Score
167	0	150	317

BIN: 1

	BEFORE SCORE				AFTER SCORE			
	Consequence x	Multiplier x	Probability	= Score	Consequence x	Multiplier x	Probability	= Score
Public S and H	30	1.00	0.0001	0	30	1	0.0001	0
Site S and H	10	1.00	0.0001	0	10	1	0.0001	0
Compliance	150	1.00	1.0000	150	1	1	0.0001	0
Mission	150	1.00	0.1000	15	75	1	0.0001	0
Cost-Effective	15	1.00	0.0001	0	15	1	0.0001	0
Environmental	20	1.00	0.1000	2	20	1	0.0001	0

FUNDING: GPP/LL **ACCOUNT#:** 72085-5751 **ASSET_NO:** 0900

COST_NOTES:

Funding Allows FY01 ($400K), FY02 ($600K), FY03 ($800K) by GPP, Account # 72107.

Profile in Thousands

	PY	FY99	FY00	FY01	FY02	FY03	UNFUNDED	TEC
Allocation								
Cost							1,800	1,800

ESH FUNCTIONAL AREA:

CW01 %: 100 Groundwater Protection Management

%:

%:

%:

%:

%:

ESH DRIVER:

Secondary Drivers

Primary Driver

OTH [OTHER]

ADS - PROJECT LISTING

SYSTEM	DESCRIPTION	STATUS
System 1 – AGS Magnet	System Mod - Eliminating piping and coolers carrying tritiated water outdoors using HX pumps & Tower for pre-cooling.	Inactive
System 2 - AGS Chilled Water	PLC Mod - Add Monitoring & Control.	Active FY-02
System 3 - AGS Fast Quad Water	System Mod - Disconnect system from ring & add chillers to "18" Houses at 13 separate locations.	Eng. Review
	PLC Mod - Add temporary Monitoring & Control until completion of the system upgrade listed above.	Completed
System 4 - RF Power Amplifier	System Mod - Eliminates piping and coolers carrying tritiated water outdoors with the addition of new HX, pumps etc.	Active FY-02
System 5 - BLIP Beam Stop	PLC Mod - Add Monitoring & Control	Active FY-02
System 6 - Collider Injection	PLC monitoring and secondary containment - Priority was reduced because the tritiated level dropped below the drinking water standard.	Low Priorty
System 7 - AGS F10 Cooler	System Mod - Replace cooler with heat exchanger and tower	Eng. Review
	PLC Mod - AGS F10 Cooler, Add PLC Monitoring & Control.	Active FY-02
System 8 - g-2,V Target & V Line	PLC Mod - Add Monitoring & Control	Completed
	Additional PLC monitoring required	Reopened
System 9 - C-Line	PLC Monitoring & Control system completed before FY-01.	Completed
System 10 - SEM	System Mod - Reduces Tritium Volume by eliminating activated water piping across South Wiring Tunnel. This modification maintains ALL SEM piping within 912.	Completed
System 11 - RF Cavity	System Mod - Apply secondary containment to outside piping	Inactive
	PLC Mod - Add Monitoring & Control	Active FY-02
System 12 - LINAC Transport	PLC Mod - Upgrade Monitoring & Control	Active FY-02
System 13 - Booster Magnet & RF	PLC Mod - Upgrade Monitoring & Control.	Completed
System 14 - Fan Houses	Add PLC Monitoring & Control. Duplicate of System 2.	Deleted
System 15 - Reference Magnet Cooling	System Mod - Apply secondary containment to outside pipes.	Inactive

DATE: March 12, 2001

TO: Henry Biedenkapp

FROM: R. A. Grandinetti

SUBJECT: ADS Listing

ADS #	TITLE	TYPE	FUNDING	STATUS
A98D0166	Cooling Twr Basin Relining	Infrastructure GPP	80K Est Not Funded	No work, Tower may be Phased Out
AA0D0023	RFMG Control Upgrade Ph II	AIP Project	500K Est Not Funded	Phase II design work near complete Currently funded under ADS # AA0D0007
AA0D0024	PA Modifications	AIP Project	100K Est Not Funded	Design work near complete Currently funded under ADS # AA0D0007
AA0D0025	"18" House Cooling Upgrade	AIP Project	100K Est Not Funded	Design work near complete Currently funded under ADS # AA0D0007
AA0D0026	F-10 Control Upgrade	AIP Project	125K Est Not Funded	PLC Scope effort currently in process Currently funded under ADS # AA0D0007
AA0D0027	RHIC Injector Upgrade	AIP Project	150K Est Not Funded	PLC Scope not currently in process Should be added to ADS # AA0D0007
AA0D0028	RHIC Compressor Cooling Control Upgrade	AIP Project	100K Est Not Funded	Not part of current "Work in Process"
P98D0013	Modernization Controls For Water Sysems	Infrastructure GPP	240K Est Not Funded	PLC Scope effort currently in process Currently funded under ADS # AA0D0007

cc: A. Pendzick A. Mc Nerney E. Lessard